

Rishabh A. Singh

CONTACT INFORMATION Computer Science and Artificial Intelligence Laboratory
Massachusetts Institute of Technology Voice: (617) 233-5861
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Cambridge, MA 02139 USA

RESEARCH INTERESTS Program synthesis, Formal Methods, Software Verification and Model Checking

EDUCATION **Massachusetts Institute of Technology**, Cambridge, Massachusetts USA

PhD,(Sept 2010 - Present) Computer Science and Artificial Intelligence Laboratory

- Advisor: Prof. Armando Solar-Lezama and Dr. Sumit Gulwani
- PhD thesis: Human centric Program Synthesis

MS, July 2010 Computer Science and Artificial Intelligence Laboratory

- GPA 5.0/5.0
- Advisor: Prof. Armando Solar-Lezama
- MS thesis: Storyboard Programming of Data Structure Manipulations
- *William A. Martin Memorial Thesis Award* for outstanding master thesis

Indian Institute of Technology, Kharagpur, West Bengal INDIA

B.Tech.(Honors) Department of Computer Science and Engineering, May 2008

- CGPA 9.60/10
- *Ranked 1st* (68) in the Department and *2nd*(750) in the Institute
- Advisor: Prof. Andrey Rybalchenko
- Bachelor Thesis: Demand Driven Abstraction Refinement

Kendriya Vidyalaya ONGC, Dehradun, Uttaranchal INDIA

All India Senior Secondary Examination, May 2004

- Secured 97.6 % marks in XII AISSCE CBSE 2004
- *Ranked 1st* in India
- Awarded to be *Prime Minister's* guest at Republic Day Parade,Rajpath New Delhi 2005

PUBLICATIONS

Rishabh Singh, Sumit Gulwani. **Synthesizing Number Transformations from Input-Output Examples**. 24th International Conference on Computer Aided Verification (CAV 2012)

Rishabh Singh, Armando Solar-Lezama. **SPT: Storyboard Programming Tool**. 24th International Conference on Computer Aided Verification (CAV 2012)

Rishabh Singh, Sumit Gulwani. **Learning Semantic String Transformations from Examples**. 38th International Conference on Very Large Databases (VLDB 2012)

Sumit Gulwani, William Harris, Rishabh Singh. **Spreadsheet Data Manipulation Using Examples**. CACM Research Highlight, **August 2012**

Rishabh Singh, Armando Solar-Lezama. **Synthesizing data-structure manipulations using Storyboards**. 8th joint meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering (**ESEC/FSE 2011**)

Rishabh Singh, Dimitra Giannakopoulou, Corina Pasareanu. **Learning Component Interfaces with May and Must Abstractions**. 22nd International Conference on Computer Aided Verification (**CAV 2010**)

Derek Rayside, Zev Benjamin, Rishabh Singh, Joseph P. Near, Aleksandar Milicevic, Daniel Jackson. **Equality and Hashing for (almost) Free: Generating Implementations from Abstraction Functions**. 31st International Conference on Software Engineering (**ICSE 2009**)

Andrey Rybalchenko, Rishabh Singh. **Subsumer-first: Steering Symbolic Reachability Analysis**. 16th International SPIN Workshop on Model Checking of Software (**SPIN 2009**)

AWARDS

- **Microsoft Research PhD Fellowship**, Microsoft Research, 2012
- **Microsoft Golden Volcano Award** and **Thought Leadership Award** for Quick-Code project, Microsoft 2010
- **William A. Martin Memorial Thesis Award** for outstanding Master's thesis in Computer Science, MIT 2010
- **Institute Silver Medal**, IIT Kharagpur, 2008 for best academic performance in the Department of Computer Science and Engineering
- **Bigyan Sinha Memorial Prize**, IIT Kharagpur, 2008 for securing 2nd position in the Institute
- **Prime Minister's** guest at Republic Day Parade, Rajpath New Delhi, 2005 for securing 1st position in AISSCE CBSE 2004

PATENTS

Sumit Gulwani, Rishabh Singh and Dany Rouhana. **Inductive Synthesis of Table-based string transformations**

Chad Rothschilder, Daniel Battagin, Christopher Benedict, Rodrigo Moreira-Silveria, Dimitri O. Danilov, Eric Cohen, Sumit Gulwani, Dany Rouhana, Rishabh Singh, Benjamin Zorn and Ramarathnam Venkatesan **Formatting Data by Example**

Sumit Gulwani and Rishabh Singh. **Semantic Entity Manipulation using Input-Output Examples**

RESEARCH INTERNSHIPS

Microsoft Research Redmond, Dr. Sumit Gulwani, Seattle, USA

Semantic Entity Manipulation for End-users

June 2011 to August 2011

Microsoft Research Redmond, Dr. Sumit Gulwani, Seattle, USA

End-user programming with Input-Output examples

June 2010 to August 2010

NASA Ames Research Center, Dr. Dimitra Giannakopoulou and Dr. Corina Păsăreanu, California, USA

Learning Component Interfaces with May and Must Abstractions

June 2009 to

August 2009

Max Planck Institute of Software Systems, Prof. Andrey Rybalchenko, Saarbrücken, Germany

Demand Driven Abstraction Refinement

December 2007

Ecole Polytechnique Federal de Lausanne, Prof. Thomas Henzinger, Lausanne, Switzerland

Lazy ARMC Heuristics

May 2007 to July 2007

SERVICE

External Reviewer: **EMSOFT 2009, ESOP 2010, POPL 2011, VMCAI 2011, TACAS 2011, SAS 2011**

TEACHING

- **TA 6.006 : Introduction to Algorithms**, Spring 2009, Fall 2010

TECHNICAL SKILLS

Programming: C, Prolog, C++, C#, F#, Perl, Java, OCaml, Python
Languages: Hindi and English

HOBBIES

- Selected to represent **INDIA**, junior national bridge team at **World Mind Games, Beijing, 2008**